

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 159 877 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

05.12.2001 Bulletin 2001/49

(51) Int Cl.7: **A23D 9/00, A23D 7/00,**
C11B 7/00, C11C 3/10

(21) Application number: **01202037.6**

(22) Date of filing: **29.05.2001**

(84) Designated Contracting States:

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR

Designated Extension States:

AL LT LV MK RO SI

(30) Priority: **29.05.2000 MY 0002388**

(71) Applicant: **Premium Vegetable Oils Berhad**
50000 Kuala Lumpur (MY)

(72) Inventor: **Sahasranamam, Ullanoor Madam**
Ramasubramaniam
80100 Johor Bahru (MY)

(74) Representative: **Barendregt, Frank, Drs.**
van Exter Polak & Charlouis B.V.,
P.O. Box 3241
2280 GE Rijswijk (NL)

(54) **Trans free hard structural fat for margarine blend and spreads**

(57) A Trans free hard structural fat suitable for the manufacture of low SAFA (Saturated Fatty Acid) poly/mono unsaturated margarine and spreads and fat blends for margarine/spreads. The structural fat is made from selectively fractionated non-hydrogenated high

melting palm oil fraction which is interesterified with dry fractionated non hydrogenated palm kernel fraction with high yield ratios that can be economically and commercially used as structural fat for the aforesaid manufacture.

EP 1 159 877 A2

DescriptionDescription:

[0001] We hereby declare the invention for which we pray that a patent be granted for the product and the process by which it is performed which is particularly described by the following statements:-

[0002] The present invention is concerned with a Trans free hard structural fat suitable for the manufacture of low SAFA (Saturated Fatty Acid) poly/mono unsaturated margarine and spreads and fat blends for margarine/spreads using the above mentioned structural fat. This structural fat is made from selectively fractionated non-hydrogenated palm oil fraction, which is interesterified with dry fractionated non-hydrogenated palm kernel fraction to obtain hard structural fat with high yield ratios that can be economically and commercially used as structural fat for the manufacture of Trans free low SAFA, poly unsaturated/mono unsaturated margarine/spreads.

[0003] Historically emulsified fat system in margarine/spreads has been designed to satisfy customer requirements such as significant cooling impact, a rapid sharp melt sensation, and no coated or waxy feel on the tongue. In addition, it should impart temperature cycling stability (heat stability) as well as spreadability when taken out frequently from the refrigerators are the prominent features.

[0004] To achieve these objectives, margarine fat blend is being formulated using hard stocks derived by hydrogenation of liquid oils.

[0005] However, with the adverse effect of Trans fatty acids being published, consumers are looking for margarine / spreads with practically no Trans fatty acids.

[0006] This can be achieved by using fully hydrogenated fats as structural fat, which usually does not contain Trans fatty acid or very negligible amount.

[0007] Hydrogenation process is generally viewed as the main reason for the development of Trans fatty acids in oils and fats. Hence, there is a strong consumer perception against usage of and hydrogenated oil/fat in the food products including margarine / spreads.

[0008] Hence research work is being carried out for developing margarine/spreads using no hydrogenated oils in their hard stock at the same time looking at the possibility of reducing the saturated fatty acid levels (SAFA) in the products

Theoretical Considerations

[0009] The hard stock contributes triglycerides especially of the trisaturated type. A certain minimum quantity of these is essential to provide the "structural fat" and to prevent oiling out of the liquid oil. From the patent literature and general experience, this minimum quantity is around 6%. More is acceptable and desirable if the amount of H₃ triglycerides, and especially tristearin, is not greater than 2% otherwise poor mouth feel will result. Hence content of H₂M triglycerides is valuable, to give the structuring effect, hence the need for a lauric oil.

[0010] When the hard stock components are interesterified, the amounts of trisaturated triglycerides in the interesterified product are determined entirely by the content of saturated fatty acids in the blend. This relationship is very critical as shown by the results:

% Saturated FA in the Oil blend	% Trisaturated Triglycerides After Interesterification
50	13
60	22
70	34
80	51
90	73

[0011] Taking sunflower oil as the PUFA oil to be used in the blend, at a level of 80% (SAFA 10.3%) then the hard stock should not contribute more than 11.76% SAFA to the final blend considering that the SAFA content of polyunsaturated margarine should not exceed 20%. If 20% of the hard stock were used for the margarine blend along with Sunflower oil as above (a high usage level) - and if we also want a minimum of 6% trisaturated Tgs in the final blend, it can be seen from the above table that the SAFA content of the hard stock must be about 67% so that interesterified hard stock has 30% trisaturated triglyceride. Assuming only 15% hard stock is used then the SAFA content of the hard stock must be about 74%, so that it has 40% trisaturated triglyceride after interesterification. These are minimum requirements and a higher amount of trisaturated Tgs would be desirable.

[0012] The usage of hard structural fat in the blend can be 5 to 25% and the liquid oil or its blends can be 95 - 75%.

Claims

1. A margarine blend and spread consisting of 60 - 95% of a liquid oil such as sunflower oil, Canola oil, soy oil, pea nut oil, rice bran oil, olive oil, safflower oil, corn oil or marine oil or the blend of any of the above liquid to be blended with a Trans free hard structural fat at 5 - 40% level whereby the said hard structural fat is made from selectively fractionated non-hydrogenated palm oil fraction, which is interesterified with lauric fat such as dry fractionated non-hydrogenated palm kernel fraction without using hydrogenation process and without using organic solvent or detergent for fractionation.
2. A margarine/spread fat blend according to claim 1, where the liquid oil blend has high poly/mono unsaturated level such that in the total fat blend the poly/mono unsaturation level exceeds 40% so that health claim such as high poly/mono unsaturated, low saturated fatty acid (SAFA) margarine/spreads can be made.
3. A hard structural fat according to claim 1 is produced without using hydrogenation process so that Trans fatty acid residue produced during the hydrogenation is eliminated.
4. A hard palm fraction according to claim 1 has a C16 carbon chain residue greater than 70% preferably greater than 80% and most preferably greater than 84%.
5. A hard palm fraction according to claim 1 has a melting point higher than 57 Deg C, preferably greater than 60 Deg C and can be flaked for easy handling because of its high melting point in spite of not being required to undergo hydrogenation and has a solid fat content of > 75% at 40 Deg C preferably > 80% solids at 40 Deg C.
6. A process according to claim 1 wherein palm fat/ palm oil or its stearin fraction is selectively dry fractionated by melt crystallization process to harvest the hard palm fraction with C16 level of > 75%, preferably > 83% with a total unsaturation level of < 15% preferably less than 10%.
7. A process according to claim 6 wherein palm fat/ oil is dry fractionated using two steps melt crystallization process, the first step is being performed between 20-25 Deg C, preferably between 22-24 Deg C, to obtain a medium hard palm fraction and the medium hard palm fraction is then once again dry fractionated between 45-55 Deg C, more preferably 49-52 Deg C depending of the iodine number of the first dry fraction, to harvest very hard palm fraction rich in C 16 fatty acids.
8. A process according to claim 6 in which the palm fraction in the second fraction step is separated in high pressure membrane type filter wherein a pressure of 10-35 bar is used, preferably > 20 bar, most preferably > 30 bar is used to inflate the membrane so as to remove the liquid fraction occluded in the hard fat, thus eliminating the requirement of solvent fraction method. This does not exclude use of high pressure hydraulic pressing of the cooled slab of palm oil fraction to obtain the same desired hard palm fat suitable for the manufacture of hard structural fat (a labor intensive process).
9. A margarine fat blend according to claim 1 wherein the hard structural fat is produced by interesterification reaction of hard palm fraction with hard palm kernel fraction, the resultant hard fat is not further fractionated but used as such as a hard structural fat, thus eliminating a further processing which in turn result in high yield of the structural fat at a lower cost.
10. A margarine fat blend according to claim 1 wherein the hard structural fat is produced by interesterification reaction of hard palm fraction with hard palm kernel fraction without having to further undergo fractionation process, thus eliminating the disposal problems of byproduct fractions associated with such processing to obtain hard structural fat.
11. A margarine fat blend according to claim 1 where in the hard structural fat is produced by interesterification reaction of hard palm fraction with hard palm kernel fraction such a way that the hard structural fat has a trisaturated triglyceride of H₃ type of C 16 and above is less than 25% preferably less than 20%.

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 159 877 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:

18.09.2002 Bulletin 2002/38

(51) Int Cl.7: **A23D 9/00**, A23D 7/00,
C11B 7/00, C11C 3/10

(43) Date of publication A2:

05.12.2001 Bulletin 2001/49

(21) Application number: **01202037.6**

(22) Date of filing: **29.05.2001**

(84) Designated Contracting States:

**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**

Designated Extension States:

AL LT LV MK RO SI

(30) Priority: **29.05.2000 MY 0002388**

(71) Applicant: **Premium Vegetable Oils Berhad
50000 Kuala Lumpur (MY)**

(72) Inventor: **Sahasranamam, Ullanoor Madam
Ramasubramaniam
80100 Johor Bahru (MY)**

(74) Representative: **Barendregt, Frank, Drs.
Exter Polak & Charlouis B.V.,
P.O. Box 3241
2280 GE Rijswijk (NL)**

(54) **Trans free hard structural fat for margarine blend and spreads**

(57) A Trans free hard structural fat suitable for the manufacture of low SAFA (Saturated Fatty Acid) poly/mono unsaturated margarine and spreads and fat blends for margarine/spreads. The structural fat is made from selectively fractionated non-hydrogenated high melting palm oil fraction which is interesterified with dry

fractionated non hydrogenated palm kernel fraction with high yield ratios that can be economically and commercially used as structural fat for the aforesaid manufacture.

EP 1 159 877 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 20 2037

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 96 19115 A (UNILEVER PLC ; UNILEVER NV (NL)) 27 June 1996 (1996-06-27) * page 7, line 20 - page 9, line 22 * * page 12, line 10 - line 26 * * examples II-VII, XI, XII * * claims 1-4, 6-11 *	1-4, 11	A23D9/00 A23D7/00 C11B7/00 C11C3/10
Y	---	7-10	
X	GB 2 270 925 A (PALL CORP) 30 March 1994 (1994-03-30) * page 11, line 32 - page 20, line 8 * * claims 1, 9-11 *	5, 6	
Y	---	7, 8	
X	CA 2 098 314 A (ROSE CHARLENE) 17 December 1994 (1994-12-17) * the whole document *	1-3	
Y	---	9, 10	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A23D C11B C11C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		29 July 2002	Dekeirel, M
CATEGORY OF CITED DOCUMENTS			
<p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EP 01 20 2037 (P40001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 20 2037

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

29-07-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9619115 A	27-06-1996	AU 713420 B2	02-12-1999
		AU 4303396 A	10-07-1996
		CA 2207954 A1	27-06-1996
		CZ 9701865 A3	14-01-1998
		WO 9619115 A1	27-06-1996
		EP 0806898 A1	19-11-1997
		FI 972543 A	16-06-1997
		HU 77040 A2	02-03-1998
		JP 10506535 T	30-06-1998
		PL 320962 A1	24-11-1997
		SK 80497 A3	05-11-1997
		TR 960617 A2	21-07-1996
		US 6156370 A	05-12-2000
		US 5858445 A	12-01-1999
		ZA 9510404 A	09-06-1997
GB 2270925 A	30-03-1994	US 5395531 A	07-03-1995
		AU 664759 B2	30-11-1995
		AU 4206593 A	14-04-1994
		AU 677928 B2	08-05-1997
		AU 4220196 A	06-06-1996
		BE 1007448 A3	04-07-1995
		BR 9303801 A	05-07-1994
		CA 2084578 A1	29-03-1994
		CH 686372 A5	15-03-1996
		CH 687329 A5	15-11-1996
		CN 1101667 A	19-04-1995
		CN 1173532 A	18-02-1998
		DE 4330256 A1	31-03-1994
		DK 109593 A	29-03-1994
		FR 2696184 A1	01-04-1994
		IT 1260678 B	22-04-1996
		JP 8053691 A	27-02-1996
		JP 2516729 B2	24-07-1996
		JP 6228588 A	16-08-1994
		MX 9304407 A1	31-03-1994
		NL 9301423 A	18-04-1994
		RU 2105048 C1	20-02-1998
		SE 507165 C2	20-04-1998
		SE 9302819 A	29-03-1994
CA 2098314 A	17-12-1994	CA 2098314 A1	17-12-1994

EPO FORM P4452

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82